

A VARIABLE GAIN RECEIVED SIGNAL STRENGTH INDICATOR

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5

ABSTRACT OF THE DISCLOSURE

An RSSI circuit provides a relatively inexpensive technique for accurately measuring received signal strength over a wide dynamic range. A received signal is processed by a rectifier circuit that generates a series of DC offsets of increasing magnitude. The DC offsets are imposed on a first polarity of the received signal to create a series of outputs that are the first polarity of the received signal with increasing DC offsets. Each of the outputs is coupled to one input of a weighted comparator with the other input of the comparator coupled to a second and opposite polarity of the received signal with no offset. The comparators provide an inactive output so long as the amplitude of the second polarity of the received signal is greater than the amplitude of the first polarity with the DC offset. The comparators provide an active output when the amplitude of the received signal of the first polarity overcomes the offset to exceed the amplitude of the received signal of the second polarity. The received signal strength at any given time is therefore indicated by the highest DC offset that has been overcome at that point in time. The offsets can be made to increase from zero by a step increment measured in dB that is equal for all offsets and thus equal to the total dynamic range in dB of the received signal divided by the number of offsets. The resolution can therefore be increase by simply generating more offsets. The rectifier circuit can be broken into two or more sub-circuits each of which is allocated to handle a particular portion of the dynamic range. The received signal can be amplified for the sub-circuit(s) allocated to the lower portions of the dynamic range to increase the ability of the rectifier sub-circuit to detect the point at which the offset polarity exceeds the non-offset polarity over noise that may be present in the system. A variable gain amplifier can be used to adjust the gain of the received signal to compensate for the gain that may be introduced by signal processing components such as amplifiers and down-conversion circuits that may reside in the receive signal path prior to the RSSI.